WHAT IS CLAIMED IS:

1. A method of forming single crystal spinel wafers, comprising:
providing a batch melt in a crucible;
growing a spinel single crystal boule from the melt;
restricting annealing to a time period not greater than about 50 hours; and
slicing the boule into a plurality of wafers.

2. The method of claim 1, wherein annealing is restricted to a time period of not greater than 30 hours.

3. The method of claim 1, wherein annealing is restricted to a time period of not greater than 20 hours.

4. The method of claim 1, wherein annealing is restricted to a time period of not greater than 10 hours.

5. The method of claim 1, wherein annealing is substantially completely eliminated.

6. The method of claim 1, wherein the wafers are non-stoichiometric.

7. The method of claim 1, wherein the boule has the general formula $aAD \cdot bE_2D_3$, wherein A is selected from the group consisting of Mg, Ca, Zn, Mn, Ba, Sr, Cd, Fe, and combinations thereof, E is selected from the group consisting Al, In, Cr, Sc, Lu, Fe, and combinations thereof, and D is selected from the group consisting O, S, Se, and combinations thereof, wherein a ratio $b:a > 1:1$ such that the spinel is rich in E_2D_3.

8. The method of claim 7, wherein A is Mg, D is O, and E is Al, such that the single crystal spinel has the formula $aMgO \cdot bAl_2O_3$.

9. The method of claim 1, wherein the spinel single crystal boule is formed by a method selected from the group consisting of a Czochralski method, a Bridgman method, a liquefied encapsulated Bridgman method, a horizontal gradient freeze method, an edge defined growth method, a Stockberger method or a Kryopolus method.

10. A single crystal spinel wafer formed according to the method of claim 1.

11. A method of forming single crystal spinel wafers, comprising:
providing a batch melt in a crucible; and
growing a spinel single crystal boule from the melt, at a process aspect ratio of not less than about 0.39, wherein process aspect ratio is defined as a ratio of average boule diameter to crucible inside diameter; and
slicing the boule into a plurality of wafers.

12. The method of claim 11, wherein the process aspect ratio is not less than about 0.40.

13. The method of claim 11, wherein the process aspect ratio is not less than about 0.42.

14. The method of claim 11, wherein the process aspect ratio is not less than about 0.43.

15. The method of claim 11, wherein the process aspect ratio is not less than about 0.44.

16. The method of claim 11, wherein the process aspect ratio is effective to prevent flipping of the boule from a [111] orientation to a different orientation.

17. The method of claim 11, wherein the boule is non-stoichiometric.

18. The method of claim 11, wherein the boule has the general formula $aAD \cdot bE_2D_3$, wherein A is selected from the group consisting of Mg, Ca, Zn, Mn, Ba, Sr, Cd, Fe, and combinations thereof, E is selected from the group consisting Al, In, Cr, Sc, Lu, Fe, and combinations thereof, and D is selected from the group consisting O, S, Se, and combinations thereof, wherein a ratio $b:a > 1:1$ such that the spinel is rich in E_2D_3.

19. The method of claim 18, wherein A is Mg, D is O, and E is Al, such that the single crystal spinel has the formula $aMgO \bullet bAl_2O_3$.

20. The method of claim 11, wherein the single crystal is grown by contacting a seed crystal with the melt.

21. The method of claim 20, wherein the seed crystal and the melt are rotated with respect to each other during growing.

22. The method of claim 11, wherein the spinel single crystal boule is formed by a method selected from the group consisting of a Czochralski method, a Bridgman method, a liquefied encapsulated Bridgman method, a horizontal gradient freeze method, an edge defined growth method, a Stockberger method or a Kryopolus method.

23. A method of forming single crystal spinel wafers, comprising:
providing a batch melt in a crucible;
growing a spinel single crystal boule from the melt;
cooling the boule at a cooling rate not less than about 50°C/hour; and
slicing the boule into a plurality of wafers.

24. The method of claim 23, wherein cooling is carried out at a rate not less than 100°C/hour.

25. The method of claim 23, wherein cooling is carried out at a rate not less than 200°C/hour.

26. The method of claim 23, wherein cooling is carried out at a rate not less than 300°C/hour.

27. The method of claim 23, wherein the boule is non-stoichiometric.

28. The method of claim 23, wherein the boule has the general formula $aAD \cdot bE_2D_3$, wherein A is selected from the group consisting of Mg, Ca, Zn, Mn, Ba, Sr, Cd, Fe, and combinations thereof, E is selected from the group consisting Al, In, Cr, Sc, Lu, Fe, and combinations thereof, and D is selected from the group consisting O, S, Se, and combinations thereof, wherein a ratio $b:a > 1:1$ such that the spinel is rich in E_2D_3.

29. The method of claim 28, wherein A is Mg, D is O, and E is Al, such that the single crystal spinel has the formula $aMgO \bullet bAl_2O_3$.

30. The method of claim 23, wherein the spinel single crystal boule is formed by a method selected from the group consisting of a Czochralski method, a Bridgman method, a liquefied encapsulated Bridgman method, a horizontal gradient freeze method, an edge defined growth method, a Stockberger method or a Kryopolus method.

31. A method of forming single crystal spinel wafers, comprising:
providing a batch melt in a crucible;
growing a spinel single crystal boule from the melt, at a process aspect ratio of not less than about 0.39, wherein process aspect ratio is defined as a ratio of average boule diameter to crucible inside diameter;
cooling the boule at a cooling rate not less than about 50°C/hour;
restricting annealing to a time period not greater than about 50 hours; and
slicing the boule into a plurality of wafers.